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| EXAMINER | |
|---|---|
| SKOVHOLT, JONATHAN | |
| ART UNIT | PAPER NUMBER |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/528,197 | CLUFF ET AL. | |
| | Examiner | Art Unit | |
| | Jonathan Skovholt | 2877 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *17 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-13,15 and 16* is/are rejected.

7)☒ Claim(s) *7 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *3/17/* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/17/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

The drawings are objected to because many features are difficult to see. Specifically the difficult features to see are the "rotation means" (5) in Fig. 1A-B, the graphs of Fig. 3 (including the labels of each axis and the data plot), and the features of Fig. 5 & 6. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the polarization translation means of

claim 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

The disclosure is objected to because of the following informalities: "the distance R" (p. 9, paragraph 3) should be changed to --the distance r-- to keep the parameter "r" consistent throughout the application.

Appropriate correction is required.

### *Claim Analysis*

Apparatus claims must be structurally distinguishable from the prior art. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Limitations following "adapted for," "designed to," "can be," and "capable of" are not positive limitations and thus are not given patentable weight. See MPEP 2111.04. Specifically, these occur in:

- **Claim 3** "configured to vary the speed... with time", and
- **Claim 4** "configured to oscillate said element... most 40°".

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**Claims 1, 5-6, 8-13, & 15-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chavanne et al. (**US Patent 6,144,456**) ("Chavanne").

Regarding **claim 1**, Chavanne teaches an apparatus for varying the path length of a beam of radiation, the apparatus comprising:

- an element (15) rotatably mounted about an axis (37), said element comprising two reflective surfaces (39a-d) in fixed relation to one another such that radiation

may be reflected between said reflective surfaces and out of the element (see Fig. 1-4); and

- driving means for rotatably oscillating said element about said axis (as element (15) rotates, it oscillated between $\pi$ and $-\pi$ radians) (col.2 ln.25-35, col.2 ln.46-67, col.4 ln.51-col.5 ln.8).

Regarding **claim 5**, Chavanne teaches all as applied to claim 1 above, in addition Chavanne teaches an apparatus wherein said element comprises a solid optic and said reflective surfaces are provided by surfaces of said optic (element (15) is a solid optic with an index of refraction of 1.5 or 2.5 and the reflective surfaces are provided at the surface of the optic (col.3 ln.53-62, col.4 ln.51-col.5 ln.8, col.5 ln.39-50, Fig. 1-4).

Regarding **claim 6**, Chavanne teaches all as applied to claim 5 above, in addition Chavanne is silent to an apparatus wherein the said reflective surfaces are metallised. Chavanne does teach reflective coatings on the reflections surfaces (col.3 ln.53-62, col.4 ln.51-col.5 ln.8)

It would be obvious to one of ordinary skill in the art to use metallised coatings to improve the reflectivity of the internal reflection surface within the solid optic (15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the apparatus from Chavanne with metallised coatings to improve the internal reflectance of the solid optic.

Regarding **claims 8-9**, Chavanne teaches all as applied to claim 5 above, in addition Chavanne teaches an apparatus wherein the solid optic comprises a material having a higher refractive index than 1 and a refractive index of at least 1.2 (col.3 ln.53-62, col.5 ln.39-50).

Regarding **claim 10**, Chavanne teaches all as applied to claim 1 above, in addition Chavanne teaches an apparatus further comprising a reflecting member configured to reflect radiation exiting the element back into the element (element (30) reflects radiation exiting element (15) back into element (15)), the reflecting member being configured such that radiation reflected back into the element exits the element along a fixed final exit path regardless of the rotational position of the element (col.2 ln.25-35, col.2 ln.46-67, col.4 ln.51-col.5 ln.8, Fig. 1-4).

Regarding **claim 11**, Chavanne teaches all as applied to claim 10 above, in addition Chavanne teaches an apparatus wherein radiation which enters the element for a first time follows a first path and the reflecting member is configured to reflect radiation back into the element such that the radiation reflected by the reflecting member follows the first path in reverse (the incoming light into element (15) of Fig. 1 follows the same path after reflecting off of mirror (30)) (Fig. 1-4).

Regarding **claim 12**, Chavanne teaches all as applied to claim 11 above, in addition Chavanne teaches an apparatus wherein said reflecting member is provided with polarisation translation means (19b, Fig. 1).

Regarding **claim 13**, Chavanne teaches all as applied to claim 10 above, in addition Chavanne teaches an apparatus wherein radiation which enters the element for a first time follows a first path and the reflecting member is configured to reflect radiation back into the element such that the reflected radiation follows a second path, said second path being said first path reversed and displaced along said rotation axis (the incoming light into element (15) of Fig. 1 follows the same path after reflecting off of mirror (30)) (Fig. 1-4).

Regarding **claim 15**, Chavanne teaches a method for varying the path length of a beam of radiation, the method comprising:

- providing an element (15) comprising two reflective surfaces in fixed relation to one another such that radiation may be reflected between said reflective surfaces and out of the element;
- rotatably mounting said element about an axis (37); and
- rotatably oscillating said element about said axis (as element (15) rotates, it oscillated between $\pi$ and $-\pi$ radians) (col.2 ln.25-35, col.2 ln.46-67, col.4 ln.51-col.5 ln.8).

Regarding **claim 16**, Chavanne teaches all as applied to claim 1 above, in addition Chavanne teaches a system for investigating a sample, the system comprising:

- an emitter (radiation source (3) Fig. 1) for emitting radiation to irradiate said sample (transparent object (1));
- a detector (detector (7)) for detecting radiation reflected from or transmitted by said sample, radiation travelling from the emitter to the detector following a first path (the sample arm interferometer in Fig. 1 in cluding elements (26, 26, 1));
- means for supplying radiation along a second path (the reference arm of the interferometer in Fig. 1 including elements (31, 15, 30)) to said detector and having a phase related to that of the radiation leaving the emitter, the system further comprising an apparatus according to claim 1 ((15) Fig. 1 as is shown above), provided within either of the first or second paths (col.4 ln.7-col.5 ln.8).

**Claims 2-4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chavanne et al. **(US Patent 6,144,456)** ("Chavanne") in view of Horii et al. **(US Application 2005/0168751)** ("Horii").

Regarding **claim 2**, Chavanne teaches all as applied to claim 1 above, in addition Chavanne is silent to an apparatus where the driving means comprises a galvanometer.

Horii teaches using a galvanometer in with a reflecting element and a controller to control a path length ([0098]-[0102]). It is well known that galvanometers have high precision for controlling angles ([0098]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the apparatus from Chavanne with the galvanometer from Horii to control the angle of reflection with high precision.

Regarding **claim 3**, Chavanne and Horii teach all as applied to claim 2 above, in addition Chavanne teaches an apparatus where said driving means is configured to vary the speed of the dement during each oscillation such that the path length is varied linearly with time (col.7 ln.44-49).

Regarding **claim 4**, Chavanne teaches all as applied to claim 1 above, in addition Chavanne is silent to an apparatus wherein said driving means is configured to oscillate said element through an angle of at most 40°.

Horii teaches using a galvanometer in with a reflecting element and a controller to control a path length ([0098]-[0102]). The galvanometer and the galvanometer controller from Horii are configured to oscillate the reflective element through any angle, including an angle at most of 40°. It is well known that galvanometers have high precision for controlling angles ([0098]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the apparatus from Chavanne with the galvanometer from Horii to control the angle of reflection with high precision.

### *Allowable Subject Matter*

**Claims 7 & 14** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

As to **claim 7**, the prior art of record, taken alone or in combination, fails to disclose or render obvious an apparatus for varying the path length of a beam where the solid optic is a rhomboid prism and the reflecting surfaces are two facing surfaces of said rhomboid prism, in combination with the rest of the limitations of the claim.

As to **claim 7**, the prior art of record, taken alone or in combination, fails to disclose or render obvious an apparatus for varying the path length of a beam wherein said reflecting member is a first reflecting member and the apparatus further comprises a second reflecting member, said first and second reflecting members being configured such that radiation may be reflected back through said element at least four times, in combination with the rest of the limitations of the claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

Several facts have been relied upon from the personal knowledge of the examiner about which the examiner took Official Notice in this Office Action mailed. Applicant must seasonably challenge well known statements and statements based on personal knowledge when they are made by the Board of Patent Appeals and Interferences. In re Selmi, 156 F.2d 96, 70 USPQ 197 (CCPA 1946); In re Fischer, 125 F.2d 725, 52 USPQ 473 (CCPA 1942). See also In re Boon, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice). If applicant does not seasonably traverse the well-known statement during examination, then the object of the well-known statement is taken to be admitted prior art. In re Chevenard, 139 F.2d 71, 60 USPQ 239 (CCPA 1943). A seasonable challenge constitutes a demand for evidence made as soon as practicable during prosecution. Thus, applicant is charged with rebutting the well-known statement in the next reply after the Office action in which the well-known statement was made.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Skovholt whose telephone number is (571) 270-1303. The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on (571) 272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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LAYLA G. LAUCHMAN
PRIMARY EXAMINER